REMARKS

Reconsideration and allowance of the above-referenced
application are respectfully requested. Claims 1 - 19 and 36-
102 are pending with claims 1, 36, 54, 61, 78, 85, 91, 93, 95,
97, 99, and 101 being independent. Claims 1, 12, 36, 47, 54,
61, 78, 85, and 91-102 are amended. No new matter has been
added.

Objection to the Specification and Claim Rejection under 35 U.S.C. § 112

The specification is objected to for allegedly attempting
to define the term "recursive marginalization-combining
operations," which allegedly makes the specification unclear and
not enabled. Claims 2-7, 19, 38-43, and 63-68; [sic] 1-90; and
[sic] 1-102 are rejected for allegedly failing to comply with
the enablement requirement because the term "marginalization-
combining operations" is alleged to be unclear, the term "a tree
structure arranged in a parallel prefix and suffix architecture"
is allegedly not taught in the specification, and the term "a
parallel prefix and suffix architecture" is allegedly not taught
in the specification, respectively. The objection and these
rejections are traversed.

Without conceding the propriety of the Examiner's position,
and solely to expedite examination, the specification and claims
have been amended to address the Examiner's concerns. As
discussed in a telephonic interview with the Examiner, these
changes to the application should be sufficient to overcome the
objection and rejections.

In particular, any use of the term "marginalization-
combining operations" was allegedly unclear because the use of

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the term on page 6, line 5 was allegedly an unclear attempt to
define the term. As discussed with the examiner during the
telephonic interview, addition of a listing of properties of
marginalization-combining operations should be sufficient to
overcome the objection and the rejection that involved the term.
The amendment to the specification conforms with this criteria
and fully addresses the Examiner's concerns by adding a passage
describing that marginalization-combining operations are any
pair of operations that satisfy the commutative semi-ring
properties, thus, the objection and rejection regarding the term
should be withdrawn. The amended subject matter would have been
known to persons skilled in the art (Robert J. McEliece, "The
Generalized Distributive Law" (W. S. M. Aji), IEEE Trans.
Inform. Theory, vol. IT-46, no. 2 (March 2000), 325-343)(see
MPEP 2163.07(a)).

As per the remaining rejections, the Examiner confirmed
that amending the application to include "a tree structure
arranged to perform parallel prefix and suffix operations"
should be sufficient to overcome the rejections regarding the
use of the term "a tree structure arranged in a parallel prefix
and suffix architecture" and similar claim language. Each of
the independent claims has been amended to include the suggested
or similar language, thus, the remaining rejections of the
claims should be withdrawn.

In view of the amendments and telephonic interview,
applicant requests withdrawal of the objection to the
specification and the rejections of the claims.

Claim Rejections under 35 U.S.C. § 103

Claims 1-19 and 36-102 have been rejected for allegedly
being unpatentable in view of a combination of Benedetto et al.

(S. Benedetto, D. Divsalar, G. Montorsi, and F. Pollara, Soft-Output Decoding Algorithms in Iterative Decoding of Turbo Codes, TDA progress Report 42-124, Feb. 15, 1996) (Hereinafter "Benedetto"), Van Stralen et al. (U.S. Pat. No. 6,304,996) (Hereinafter "Van Stralen"), Divsalar et al. (D. Divsalar and F. Pollara, Hybrid Concatenated Codes and Iterative Decoding, TDA progress Report 42-130, August. 15, 1997) (Hereinafter "Divsalar"), and/or Stephen et al. (U.S. Pat. No. 6,484,283) (Hereinafter "Stephen"). These rejections and their underlying rationale are traversed.

At a minimum, § 103 requires the following criteria to establish a prima facie case of obviousness: (1) the prior art reference (or references when combined) must teach or suggest all the claim limitations, and (2) there must be some suggestion or motivation to combine reference teachings (see MPEP 706.02(j)). These criteria have not been met.

<u>(1) No Teaching or Suggestion in the References</u>

Independent claims 1, 36, 54, 61, 78, 85, 91, 93, 95, 97, 99, and 101 have been amended to clarify the claimed subject matter. The claims include language directed toward using a tree structure arranged to perform parallel prefix and/or suffix operations to compute forward state metrics, backward state metrics, and/or a soft-inverse of a finite state machine. Consider the exemplary language of claim 1:

> "at least one SISO module <u>using a tree structure arranged to perform parallel prefix and suffix operations</u> to compute forward and backward state metrics (emphasis added)."

Benedetto discloses soft-output decoding algorithms in iterative decoding of turbo codes (Title). Van Stralen discloses minimizing the time for calculating sigma values of a summation equation using a logarithmic implementation of

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pipelined adders (col. 8, lines 28-63). However, neither of
these cited references teach or suggest using a tree structure
arranged to perform parallel prefix and/or suffix operations to
compute forward state metrics and/or backward state metrics,
respectively, and/or a soft-inverse of a finite state machine.
Because none of the cited references disclose the subject matter
of the independent claims, the rejection of these claims should
be withdrawn.

(2) No Motivation to Combine Reference Teachings

The burden for establishing a motivation to combine the
references has not been met, thus the rejections should be
withdrawn.

The burden for establishing a motivation to combine has not
been met with respect to independent claims 1, 36, 54, 61, 78,
85, 91, 93, 95, 97, 99, and 101 because (A) the cited motivation
does not teach or suggest the broad motivation stated in the
office action, rather, it teaches a narrow motivation; and (B)
the cited motivation does not explain why the cited references
would be combined in such a way as to result in the claimed
subject matter.

As an example of the motivation to combine given in the
office action, with regard to claim 1 the office action states:

> One of ordinary skill in the art would have recognized that
> use of a tree structure arranged in a parallel prefix and
> suffix architecture would have provided the opportunity for
> high-speed turbo decoding (page 6, para. 3).

By contrast, the cited motivation (i.e., the Abstract of
Van Stralen) for the rejection of independent claims 1, 36, 54,
61, 78, 85, 91, 93, 95, 97, 99, and 101 is focused on "a
posteriori state transition probabilities" calculated by a sigma
block and increasing decoding speed by calculating alpha and

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beta probability function values in parallel. This cited
motivation is very narrow and focused such that it does not
support the broad motivation given-- that "use of a tree
structure arranged in a parallel prefix and suffix architecture
would have provided the opportunity for high-speed turbo
decoding." Thus, the burden of establishing a motivation to
combine has not been met.

In addition, the burden has not been met because the cited
motivation to combine for the rejection of independent claims 1,
36, 54, 61, 78, 85, 91, 93, 95, 97, 99, and 101 is not a
motivation that explains why the cited references would be
combined in such a way as to result in the claimed subject
matter. Each of the independent claims includes a feature
directed to a tree structure used to compute forward state
metrics, backward state metrics, and/or a soft-inverse of a
finite state machine (see e.g., claim 1 and claim 95). In
contrast to that subject matter, the cited motivation deals with
an entirely different type of computation. For example, the
alleged tree structure, the sigma block of FIG. 5a of Van
Stralen, generates a determination of a posteriori
probabilities-- which is very different from computation of
forward state metrics, computation of backward state metrics,
and/or computation of a finite state machine. Thus, the cited
motivation is insufficient to result in the subject matter of
the independent claims and the rejection of these claims should
be withdrawn.

Claims 2-19, 37-53, 55-60, 62-77, 79-84, 86-90, 92, 94, 96,
98, 100, and 102 depend, directly or indirectly, from claims 1,
36, 54, 61, 78, 85, 91, 93, 95, 97, 99, and 101. Accordingly,

applicant submits these claims are allowable for the reasons given above.

Conclusion

In view of the above amendments and remarks, therefore, all of the claims should be in condition for allowance. A formal notice to that effect is respectfully requested.
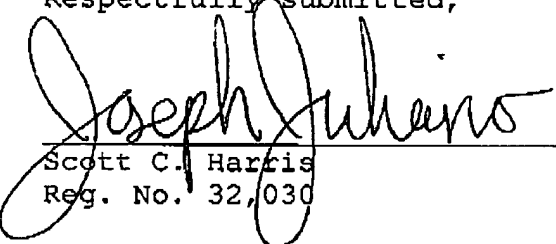
It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

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Applicant asks that all claims be allowed. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 3/16/2005

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